

1-Week Sagehen-Lake Tahoe California Naturalist Immersion Course: June 20-26 Summer 2016 Syllabus

About the Course:

The Sagehen-Lake Tahoe California Naturalist Program is a collaboration between UC Berkeley's Sagehen Creek Field Station, the UC Davis Tahoe Environmental Research Center, Sugar Pine Foundation, Tahoe Institute for Natural Science (TINS), UC Cooperative Extension and many other agencies and organizations within the region. We use a variety of approaches to present information and foster lively collaborative discussions about individual components of an ecosystem and the interconnections that make up the unified whole. Led by scholars, professionals, naturalists, and other members of the community, these sessions introduce and expand on the roles and importance of each entity using examples from Lake Tahoe and the Northern Sierra bioregion while relating to California's unique ecology and natural history. Time in the field with researchers and professionals give participants first-hand experiences in seeing nature from a scientists' perspective as well as an opportunity to interpret what they see to make meaning for themselves and others.

Immersion Course Description:

This is a residential, 6-Day class at Sagehen Creek Field Station. The station, a semi-remote outpost on Sagehen Creek north of Truckee, is surrounded by a nine-thousand acre experimental forest and serves as a thriving research hub for scientists and students. In addition to providing in-depth training in the ecology of the Sierras and California in general, we offer a unique, intimate experience within the Sagehen Creek UC Natural Reserve not available to the general public. Lodging in cabins at the station is included in the course fee and a requirement for all participants since activities begin early each day and continue through the evening hours. Meals are catered, providing tasty nourishment and al fresco dining at the station and in the field. We try to accommodate dietary restrictions if brought to our attention during registration. Participants may camp on the premises if preferred over sharing a cabin. Lodging fees, included at registration, also apply for this option. All lecture sessions take place in our outdoor, "classroom without walls". Most field sessions take place within in the Sagehen Basin, with the exception of two which take us to the Lake Tahoe Basin.

Course Instructor:

Leslie Smith: Coordinator, Sagehen Creek Field Station California Naturalist; K-12 Science and Environmental Educator; Science Education and Professional Development Consultant for FOSS; UC Berkeley, Lawrence Hall of Science

Contact Information:

Leslie Smith: sagehen-calnat@berkeley.edu

Sagehen Creek Field Station Website: <http://sagehen.ucnrs.org/events.htm#calnat>

California Naturalist Website: <http://ucanr.org/sites/UCCNP/>

Course Student Learning Outcomes:

By the end of this course, students should be able to:

- Understand what it means to be a naturalist.
- Understand the abiotic, biotic and cultural factors that make up the unique natural history and ecology of California, Lake Tahoe, and the Northern Sierras.
- Demonstrate skills in making and recording natural history observations in a field journal and on iNaturalist.
- Demonstrate skills in communicating and interpreting natural resource information.
- Apply knowledge of the California ecosystem to local and global environmental issues.

Reading and Homework

In preparation for lectures, all assigned readings from the California Naturalist Handbook should be completed before arriving at the course. A series of questions for you to complete as you read each chapter will be emailed to you upon registration.

Field Days:

Field sessions in the Sagehen Creek Basin will be interspersed with classroom sessions throughout the week. Two sessions will take participants to the Lake Tahoe Basin for the day. Participants may not bring guests, children, or dogs, and no tobacco products are allowed at the Field Station. We will be hiking and weather will vary, so pack appropriately (layers are advisable) and bring any gear you might find helpful – binoculars, hand lens, camera, etc. We will pack lunches on many days and eat in the field.

Naturalist Field Journal/Notebook:

All participants are required to keep a field journal during the course. Instructors may check field journals periodically during the class or at the end. We will be using these during class, on field trips, and hopefully on your own time. Keeping a detailed field journal is one of the best ways of recording observations for future reflection and for fostering continued learning and development as an experienced naturalist.

iNaturalist

Over the course of the California Naturalist class, each participant will be responsible for registering for an iNaturalist account (<http://www.inaturalist.org>) and adding at least 3 observations to the Sagehen Creek Biota Project. We will go over the iNaturalist tool in class.

Capstone Project:

Certification also requires that each participant plan and complete a Capstone Project. We will provide examples and guidance in developing your project. No previous experience is required. This volunteer service project must fall into one of the following four areas: Stewardship, Education/Interpretation, Citizen Science, or Program Support. The Capstone project provides an opportunity for participants to integrate the in-class material with an applied work project that is done in conjunction with a natural resource agency or organization. Participants may work individually or in teams to design and implement their Capstone Project. You must submit your project before the start of class for approval; a Capstone Project Proposal form will be provided. During the final day of the course, students will give a brief presentation about their projects to their peers. Further details on the presentation will be provided in class.

Volunteer Service:

After completing the California Naturalist training program, participants are expected to complete 40 hours of volunteer service relating to California's natural or environmental cultural history (stewardship, education/interpretation, citizen science or program support). Hours spent planning, developing and completing the Capstone Project count toward this 40-hour requirement. We provide information on local opportunities and students are encouraged to participate in and conduct activities with agencies within their own communities.

Attendance:

We ask that you make a commitment to attend all sessions during the week. Absence is generally not an issue during the Immersion Course since you remain at the field station for the entire week. Please note that, while we understand unexpected demands sometimes arise, it is very hard to substitute a make-up activity that can provide both the depth of information and experience gained in the scheduled session. If an emergency should arise, one excused absence is allowable with the understanding that it will be made up in an approved manner.

Volunteer Management System (VMS)

Participants will be provided an on-line account to track their volunteer hours, including hours spent on their Capstone Project. Tracking volunteer hours is an essential way to prove need and impact of the California Naturalist Program.

UC Credits

Participants may opt to pay an additional \$85 to receive four UC Davis Extension undergraduate academic credits upon course completion and certification. Let the instructor know that you are interested in applying for the credits at the start of class and more information will be provided.

Required Items

- Text: *The California Naturalist Handbook* authored by Greg de Nevers, Deborah Stanger Edelman, and Adina Merenlender.
- A field notebook for nature observations and drawings. More specific information about what kind of journal to bring will be given upon course registration.
- An email account.
- Suggested but Not Required: hand lens (10x), binoculars, smart phone or tablet for the iNaturalist program.

Course Fee

The fee for this course is \$990 (plus credit card fee) if paid before Jan 31, 2016. Add \$25 after this date. The fee covers: administration costs, instruction and coordination, California Naturalist certification, station fees and catering for all meals at the station. Participants are responsible for purchasing their own handbooks.

Cancellation Policy

Refunds, minus a 10% charge, will be issued if cancellation occurs prior to March 1st. The course needs 23 registered participants in order to be offered. If we are able to fill a position left by a cancellation and are able to maintain our minimum number, we will apply a refund as defined above to the original registrant.

Program Collaborators

UC Cooperative Extension

UC Davis Tahoe Environmental Research Center (TERC)

Sierra Watershed Education Partnership (SWEP)

Sierra Nevada College

Sustainable Tahoe

US Forest Service

Sugar Pine Foundation (SPF)

Tahoe Institute for Natural Science (TINS)

Immersion Course Schedule and Syllabus 2016

Monday, June 20: Day One

12:00 Arrival at Sagehen Creek- Onsite Check-in/Cabin Assignments (no lunch served)

1:00 Welcome and Agenda

Presenter: Leslie Smith: Coordinator, Sagehen California Naturalist Program

1:15 Introduction and Orientation to Sagehen Creek Field Station

Presenter: Jeff Brown: Director, Central Sierra Field Research Stations

2:15 Break

2:30 Introduction to California Naturalist Program: Requirements and Expectations -Leslie

Goals:

- To understand the California Naturalist program and the role of a California Naturalist
- To understand what naturalists do and why it is important
- To understand what is unique about California's natural history, human history, ecology and landscape
- To introduce the concept of citizen science

Objectives:

- Describe the goals of the California Naturalist Statewide Program
- List the steps to California Naturalist certification
- Identify two important naturalists. Describe the characteristics of a good naturalist
- Name three things that make California's ecology unique

3:40 Introduction to Field Journals - Leslie

4:30 Break and Prep for evening activities

5:20 Dinner

6:20 Gather at Outdoor Classroom

6:30 Presentation/Activities: Introduction to California Natural History and the role of Naturalists

Guest Speaker- TBD

Goals:

- To learn the benefits of the California Naturalist program and how the program works.
- To understand what is unique about California's natural history, human history, ecology and landscape.
- To understand what naturalists do and why it is important.
- To understand the scope and significance of Lake Tahoe and the Northern Sierras.
- To understand the work done by researchers and naturalists in the Northern Sierras and Lake Tahoe.
- To learn how to keep a naturalist's Field Notebook and journal.

Objectives:

- Identify two important naturalists.
- Describe the characteristics of a good naturalist.
- Name three things that make California's ecology unique.
- Explain the Linnean classification system.

9:00 Reflection/Bed

Tuesday, June 21: Day Two

7:30 Breakfast

8:30 Prep for the day (please arrive at the meeting area promptly at 9:00 prepared for the day's activities)

9:00 Morning Focus Session: Capstone Projects, Interpretation, Collaboration, Citizen Science (Leslie)

10:00 Presentation: Interpretation, Collaboration, and Citizen Science

Guest Speaker: Colin Robertson, Nevada Art Museum, Charles N. Mathewson Curator of Education-tentative)

Goals:

- To understand the basic principles of interpretation
- To learn techniques for presenting to and communicating with different kinds of audiences

Objectives:

- Describe three principles of successful interpretation
- Define and develop a theme for an interpretive project
- Describe how you would adapt a program for use with two different audiences
- List two things to remember about speaking at a public meeting and three things that can help make a program more successful

12:00 Drive to Incline Village; Lunch when we get there

1:30 Introduction to TERC and Docent Program Information (TCES Room 141)

2:45 Lake Tahoe 101: Lake of the Sky- The Story of Lake Tahoe (Geology and Formation of the Lake; Bathymetry of the Lake Bottom; Cultural and Environmental History; Limnology and Climate; Environmental Issues); Presentation by David Antonucci, Civil and Environmental Engineer

4:00 Everything You Wanted to Know About Lake Tahoe But Were Afraid to Ask

Presenter: Dr. S. Geoffrey Schladow, Director, UC Davis TERC

5:00 Break, Appetizers, and Happy Hour

6:00 The History and Stories of Research at Lake Tahoe : Four Decades of Research on Lake Tahoe; The Challenge Ahead

Presenter: Dr. Charles Goldman, noted freshwater scientist and founding director, UC Davis Tahoe Research Group

7:30 Return to Field Station

8:30 Reflection/Bed

Wednesday, June 22 Day Three

7:30 Breakfast (Pack lunch for field and prep for day)

9:00 Presentation and Activities: Geology, Soils, and Climate

Guest Speakers: TBD (Gary Raines, USGS; Eldridge Moores, UC Davis - tentative)

Goals:

- To understand how the geologic history of California created the current landscape.
- To understand how the geologic history of the Sierras created the current landscape.
- To understand how the landscape influences the ecology of California.
- To understand how the landscape influences the ecology of the Sierras.
- To be aware of the role that nutrient cycles and soils play in shaping plant communities.

Objectives:

- Describe how the topography of California influences climate within the state.
- Discuss how the resulting climate and soil variations influence the ecology of California.
- Discuss how local climate and soil variations influence the ecology of the Sierras.
- Name a soil type found locally and its impact on the local ecology.
- Draw the nitrogen cycle and explain its importance. Describe how agriculture has affected soils, water and land use in California.

10:00 Field Session: Geology and Soils- Gary Raines (tentative)

3:00 Break

4:00 Guided Field Journal Activity- Leslie

5:20 Dinner

6:20 Gather at Outdoor Classroom

6:30 Presentation and Activities: Plants

Guest Speaker: Leah Gardner Leah holds a Master's degree in Biogeography from UC Davis and works as a botanist/ecologist for the Cal. Dept. of Conservation. (tentative)

Goals:

- To become familiar with the Linnaean Classification System
- To understand how plants function, reproduce and adapt
- To understand the differences among native, non-native, invasive, and noxious plants
- To understand impact of human and natural disturbance on plant communities

Objectives:

- Identify by sight ten plants that are common in the Sagehen Basin: use their common and scientific names
- List three plant community types found in the Sierras
- Pick one plant in each of the local community types listed above and describe its adaptations to its environment
- Sketch the parts of a flowering plant and explain how it reproduces
- Define and describe the effects of native, non-native, invasive, and noxious plants

9:00 Reflection/Bed

Thursday, June 23 Day 4

7:30 Breakfast (Pack lunch for field and prep for day)

9:00 Morning Focus Session: Reading, discussion, activity

10:00 iNaturalist Training and Practice (*Bring Smart Phone & Laptop if you have them)

Instructor: TBD

Goals:

- To become comfortable using the iNaturalist app and website

- To understand the iNaturalist program at Sagehen

Objectives:

- Demonstrate ability to take photos and upload them to the iNaturalist site
- Create iNaturalist account (See Pre-Course Work above)
- Familiarize yourself with the Guide to Sagehen's iNaturalist project:
http://www.stanford.edu/~loarie/California_Naturalist/Sagehen_iNaturalist_Assignment.pdf

11:00 Field Session: Plants / iNaturalist Practice

Instructors- Leah Gardner/ TBD

Goals:

- To become familiar with the plants and plant communities in your local area
- To explore the relationship between plants and habitat

Objectives:

- Provide 6 iNaturalist observations from the Sagehen basin
- Identify individual plants from 3 natural plant communities in the Sagehen basin
- Describe the relationship between plant communities and environmental factors

2:30 Guided Field Journal Activity- Leslie

4:15 Break and Prep for Evening Activities

5:20 Dinner

6:20 Gather at Outdoor Classroom

6:30 Presentation: Animals (Guest Speaker- TBD)

Goals:

- To recognize the energy and evolutionary relationships among animals.
- To understand how animals are adapted to their environments.
- To understand the concepts of food webs, predator/prey relationships and trophic levels.
- To identify the economic and social importance of wildlife species in the Lake Tahoe area.

Objectives:

- List and identify by sight 10 vertebrates and invertebrates that are common in your biome, three by their common and scientific names.
- Pick an animal in your area and describe three ways it's adapted to the local environment.
- Describe a food web present in the Lake Tahoe area and identify predators and prey.
- List five wildlife species of economic and social importance in your area, at least two of which must be invertebrates, and describe their current status.

9:00 Reflection/Bed

Friday, June 24 Day 5

7:30 Breakfast (Pack lunch for field and prep for day)

8:30 Field Session: Animals

11:00 Presentation: Forest and Woodland Resources (Instructor: TBD)

Goals:

- To appreciate the ecological and economic value of forests
- To understand forest structure
- To understand the role of fire in forest regeneration
- To understand the various benefits that forests provide
- To understand the challenges of balancing society's conflicting desires for forests

Objectives:

- Name 10 local trees and 10 local shrubs

- Describe the forest types common to California
- Describe at least four benefits that forests provide to society, two economic and two ecological, and discuss how forest fragmentation affects these benefits
- Act out a forest related resource conflict, taking the point of view of at least two different stakeholders.

12:30 Field Session: Forest and Woodland Resources

3:00 Journaling Activity

4:00 Break and Prep for Evening Activities

5:20 Dinner

6:20 Gather at Outdoor Classroom

6:30 Presentation: Energy and Global Environmental Issues

Guest Speakers: TBD (Mike Wolf, Environmental Chemist; Branch Chief, Permitting and Enforcement; Air Quality Management Division, Washoe County Health District; Dr. Alison Murray, Research Professor, Earth and Ecosystem Sciences, University of Nevada, Reno)

Goals:

- To become familiar with the sources and kinds of energy
- To explore agricultural issues and their relationship with the environment
- To consider how human activities and resource use affect the global environment

Objectives:

- List three sources of renewable and three sources of non-renewable energy
- Pick one pressing global environmental issue and describe two different ways to resolve it.
- Explain the relationship between population growth and resource use

Saturday, June 25 Day 6

7:00 Breakfast (Pack lunch for field and prep for day) (*Note earlier breakfast time)

8:00 Drive to Historic Fish Hatchery- Tahoe City

9:00 Historic Hatchery Background

9:30 Food Web Research at Lake Tahoe: The ecology and food web of Lake Tahoe, Invasive Species

Presenter: Christine Ngai-Ryan, University of Nevada, Reno

10:15 Overviews of TERC Exhibits and Demonstration Garden

Presenters: Heather Segale, Alison Toy, Dave Long - TERC

12:00 Lunch

1:00 Presentation and Field Session: Water (location: Sierra Nevada College; Incline Village)

Guest Speaker: TBD (Andy Rost, Asst. Professor, Science and Technology; Sierra Nevada College, Incline Village, NV)

Goals:

- To review the hydrologic cycle and ecological water budgets
- To identify and understand the roles of parts of a watershed
- To describe the economic, ecologic and social functions of water resources
- To become exposed to water management, water quality and water distribution issues in California

Objectives:

- Describe the hydrologic cycle and three ways that humans have altered it in the West
- Explain the concept and purpose of a water budget
- Pick a water resource (wetland, stream, lake, etc.) and identify three of its important functions
- Explain the difference between non-point source and point-source pollution and give examples of each
- Name three uses of the primary water source in California and discuss any conflicts that arise over these uses

4:00 Break (Return to Field Station)

5:20 Dinner
6:20 Gather at Outdoor Classroom
6:30 Evening Activity: Capstone Project Prep
9:00 Begin Packing/Bed

Sunday, June 26 Day 7

7:15 Clean cabins/restrooms/group area (Everyone participates)
8:00 Breakfast
8:50 Gather at Outdoor Classroom
9:00 Capstone Project Presentations
11:30 Graduation Ceremony
12:00 Class adjourns (no catered lunch)